



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 91

[Docket No.: FAA-2022-1212]

Changes to Surveillance and Broadcast Services

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notification of changes to Surveillance Services.

SUMMARY: This action announces termination of the Mode-S Traffic Information Service (TIS) at 104 terminal Mode-S radar sites. The FAA is replacing these legacy terminal Mode-S radars via the Mode-S Beacon Replacement System (MSBRS) program, or may remove legacy terminal Mode-S radars as part of other ongoing activities. As each legacy terminal Mode-S Radar is replaced or removed, the FAA will no longer provide Mode-S TIS to capable transponders from that location. This change does not affect existing Traffic Information Service - Broadcast (TIS-B), Automatic Dependent Surveillance – Rebroadcast (ADS-R), or Automatic Dependent Surveillance – Same Link Rebroadcast (ADS-SLR) services currently provided to properly ADS-B equipped aircraft.

DATES: [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

FOR FURTHER INFORMATION CONTACT: For technical questions concerning this action, contact: Michael Freie, Technical Advisor, Surveillance Services, AJM-4, Air Traffic Organization, Federal Aviation Administration, 600 Independence Avenue SW, Washington, DC 20597; telephone: 202-528-2337; email: michael.freie@faa.gov.

SUPPLEMENTARY INFORMATION:

Executive Summary

In 2018, the FAA commissioned a study to assess the safety and economic impacts on general aviation owners and operators (from here on referred to as “the GA Community”) from the termination of Mode-S Traffic Information Service (TIS). The purpose of this study was to communicate information on the removal of Mode-S TIS from the National Airspace System (NAS) through user outreach and engaging with non-governmental organizations (e.g., AEA, AOPA, EAA, and GAMA). The results of the study confirmed that removal of Mode-S TIS has no significant adverse safety or economic impacts on the GA Community. Therefore, beginning in 2024, Mode-S TIS will terminate at each radar location as current Mode-S radars are replaced by the Mode-S Beacon Replacement System (MSBRS) program, or as legacy terminal Mode-S radars are removed as part of other ongoing activities. The GA Community should no longer rely on reception of TIS information from Mode-S capable radars.

I. Background

In 2000, FAA implemented Mode-S Traffic Information System (TIS) via Mode-S radar data-link functionality. Mode-S TIS has also been referred to informally as TIS-A by some in industry. Mode-S TIS was implemented by FAA in response to an NTSB recommendation suggesting improvement of situational awareness information for the general aviation (GA) community not equipped with a traffic alert and collision avoidance system (TCAS).

In May 2010, the FAA published 14 CFR 91.225 and 91.227, requiring aircraft to be equipped with Automatic Dependent Surveillance – Broadcast (ADS-B) Out equipment by 1 January 2020 in order to operate in certain U.S. airspace. ADS-B was identified as the backbone for the future of the FAA’s Next Generation (NextGen) programs. From 2010 through 2020, the FAA funded deployment of approximately 700 ADS-B radio stations across the U.S. to provide improved surveillance coverage across the NAS. Along with improving surveillance coverage, the FAA implemented functionality into ADS-B radio stations geared at providing appropriately

equipped GA aircraft with enhanced situational awareness through both Traffic Information Services – Broadcast (TIS-B) and Automatic Dependent Surveillance – Rebroadcast (ADS-R)¹. In 2016, FAA funded the addition of Automatic Dependent Surveillance – Same Link Rebroadcast (ADS-SLR) service at the busiest U.S. airports with a surface surveillance system².

Traffic Information Services

In 2017, MITRE issued a report on Mid-Air Collision (MAC) rates from 1990 to 2006. Upon the implementation of Mode-S TIS functionality into FAA terminal radars, the data showed a decline of approximately 50 percent in the GA MAC rate from 2000 to 2003 – when Mode-S TIS avionics were first being installed in GA aircraft. This lower MAC rate stabilized after 2003 when Mode-S TIS installations were largely completed and stayed at the lower level until today. Reception of Mode-S TIS information was not a functionality that was required for Mode-S transponders. To this day, a very limited set of transponders are known to be capable of receiving and processing Mode-S TIS information from FAA terminal radars.

In the decades following the initial Mode-S TIS deployment, the FAA implemented improved systems for provisioning information on proximate aircraft to GA pilots through the use of TIS-B, ADS-R and ADS-SLR services. These new services expand beyond the currently provided Mode-S TIS. Now that the ADS-B mandate is in effect, and low-cost avionics systems for receiving and displaying ADS-B, ADS-R, ADS-SLR and TIS-B information are readily available, the GA community is able to obtain a heightened situational awareness of the traffic around them. This is especially true when flying around the terminal areas where significant ADS-B coverage is available today.

As of April 3, 2022, approximately 127,755 aircraft have been identified as being 1090ES, UAT, or Dual ADS-B In capable. The vast majority of these are General Aviation

¹ More information on TIS-B and ADS-R can be found at the FAA's NEXTGEN ADS-B website: <https://www.faa.gov/nextgen/programs/adsb>

² FAA has two surface surveillance systems: ASSC (Airport Surface Surveillance Capability) and ASDE-X (Airport Surface Detection Equipment, Model X). See <https://www.faa.gov/nextgen/programs/adsb/atc/assc> and https://www.faa.gov/air_traffic/technology/asde-x.

aircraft due to the number of portable ADS-B In devices or integrated ADS-B In/Out systems available to this market.

Mode-S Radar Beacon Replacement System

Many FAA Mode-S terminal radars are approaching the end of their useful lifecycle. Additionally, the FAA is facing an increased maintenance cost from the inability to purchase parts, due to parts obsolescence or part shortages, necessary to ensure continued operational availability. To mitigate this, the FAA has initiated a radar modernization effort called the Mode-S Beacon Replacement System (MSBRS) program. Under this program, the FAA will replace at least forty-six (46) aging Mode-S terminal radars starting in 2024. Starting in 2024 as the new MSBRS radars replace the existing terminal radars, the existing Mode-S TIS functionality will disappear at the location of each replaced terminal radar.

During this timeframe, the FAA will continue to provide Mode-S TIS through the existing terminal radars until the existing radar is replaced with a new MSBRS radar. This document is intended to provide time for GA aircraft owners and operators who have not yet equipped with an ADS-B receiver to acquire and install, if appropriate, an ADS-B In capable system.

Other FAA surveillance system improvement activities

Independent of the MSBRS program, FAA is also engaged in multiple activities aimed at improving existing surveillance systems. These activities are aimed at reducing FAA operating costs and/or reducing congestion on surveillance system RF frequencies. As these activities proceed, FAA may remove one or more Mode-S terminal radars from operation, which would eliminate Mode-S TIS at that location.

II. Industry discussion on Mode-S TIS Removal

Using surveys and discussions with industry organizations, the FAA was able to obtain the necessary data required to understand the potential safety and economic impacts from removing Mode-S TIS functionality from the existing terminal radars. FAA conducted surveys,

such as the General Aviation/Part 135 Air Taxi Activity Survey, to produce a set of comprehensive data on Part 91 and Part 135 aircraft and their operations. The FAA reviewed data from survey reports for 2010, 2014, 2016, 2018, and 2019, and discussed these reports with industry association experts. The data from these reports were utilized to study the relevant surveillance equipage for all types of aircraft: Fixed Wing Piston, Fixed Wing turboprop single and multi-engine, turbojet, and rotorcraft.

The FAA worked with the Aircraft Owners and Pilots Association (AOPA) to develop a special survey of AOPA's members about the impacts of eliminating Mode-S TIS. The survey was sent to 50,000 AOPA members with 2,567 responses received by March 2021. A follow up survey was conducted in an attempt to increase the percentage of AOPA members' responses. The final number of respondents by May 2021 was 5,752 – over 10% of the aircraft owners surveyed. After the final survey results were received, AOPA and FAA performed a joint review of the collected information. In addition to answering 31 specific questions about their aircraft, its relevant avionics, hours, operations, and locations, the GA community also submitted over 700 comments pertaining to the impact of terminating Mode-S TIS. More than 50% of the GA community stated that there would be no or little impact to their traffic awareness capability and safety due to the removal of Mode-S TIS.

Over the last 3 years, the FAA has conducted industry briefings and discussions with major avionics manufacturing companies on the MSBRS program and the associated planned removal of Mode-S TIS from terminal radars. These discussions assisted in gathering pertinent information on equipage and gaining insight into potential concerns.

III. Summary

Based on data obtained from the aviation community and feedback received through industry engagement, FAA has determined that the overall safety and economic impacts due to the removal of Mode-S TIS functionality will have little to no impact on the GA community.

Replacement of the existing terminal radars capable of providing Mode-S TIS under the MSBRS Program will provide an improvement in ATC capabilities, which will benefit military and civil aviation, including General Aviation. Installation of the new state-of-the-art Mode-S radars will improve system operational reliability and reduce system down time.

Removal of legacy terminal Mode-S radars may occur as part of other ongoing FAA activities to divest radars or which are being replaced with other modern cooperative surveillance systems. These activities are being pursued to lower FAA operating costs and/or reduce congestion on surveillance system RF frequencies.

Aircraft operating within ADS-B mandated airspace, specified under 14 CFR 91.225, have transitioned their avionics equipment to be compliant with the performance requirements of the regulation. If the ADS-B Out equipment is performing and configured properly, aircraft equipped with ADS-B In are capable of receiving ADS-R, ADS-SLR, and TIS-B services from the FAA ADS-B ground stations across the NAS. These low-cost ADS-B In avionics systems are widely available, and provide the GA community with a heightened situational awareness of the traffic around them which was not previously available using solely Mode-S TIS information. These services expand coverage and more than replace the information currently provided by Mode-S TIS.

Issued in Washington, DC, on September 16, 2022.

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